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By

Ryland Derek Barton

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**On the Edge of the Big Dry:
Running Out of Water in West Texas**

APPROVED BY

SUPERVISING COMMITTEE:

Supervisor: _____

Tracy Dahlby

Russell Todd

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by

Ryland Derek Barton, B.A.

Report

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Abstract

On the Edge of the Big Dry: Running Out of Water in West Texas

Ryland Derek Barton, B.A.

The University of Texas at Austin, 2011

Supervisor: Tracy Dahlby

In the wake of the 2011 drought, finding water is one of the most pressing issues that face West Texas cities. The city of San Angelo finds itself in the unique position of being a West Texas town with several lakes, but now only has 22 months' worth of water left. In an attempt to bring more water to the drought-stricken population, the city is constructing a \$120 million pipeline to pump water 65 miles from the Hickory Aquifer—widely known to have high levels of radium that makes the water radioactive. This report, and the two accompanying audio stories, examines the implications of the move, which San Angeloans hope will secure the city's hydrological, economic, and political future.

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**On the Edge of the Big Dry:
Running Out of Water in West Texas**

All that remains of O.C. Fisher Lake in San Angelo, Texas is a two-acre puddle of what looks like rusty, semi-coagulated porridge. This year, an unrelenting drought has dwindled the sometimes-fishing lake down to less than 1 percent of its capacity.

Thousands of fish have died: their bones lie exposed on the banks of the sere coastline. Others have turned into rufous mush, killed off by algae that thrive in deoxygenated water.

In September, John Boyd came back to this childhood fishing hole of his, keen to see the apocalyptic scene for himself. All that remained of the reservoir was a football field-sized puddle of fish guts next to O.C. Fisher Dam, a lake-shaped basin of dusty cracked earth, and a field of fish skeletons.

“Just to see so many fish and such huge fish in such great numbers, just dried and leathered and rotting in the sun...it was sad,” Boyd said.

Pictures of the lake have swelled across the Internet. YouTube Jeremiahs called O.C. Fisher’s blood-red water an apocalyptic prophecy. Indiana preacher Paul Begley cited Revelations 16:3 in an Internet sermon about the event: “The third angel poured out his bowl on the rivers and springs of water and they became blood.”

“It was just carcasses everywhere,” Boyd said. “It was the worst smell—the fish from the entire reservoir basin just chasing that dying water as far as they could, as far as their gills could take oxygenated water until there wasn’t enough there for them and they died.”

But for 100,000 San Angeloans, the dried-up reservoir is a harbinger of a more terrestrial tribulation: they only have 22 months of water left.

O.C.Fisher is the most stricken of San Angelo's five reservoirs, but the other four aren't doing much better in the wake of Texas' multiyear drought.

Lake Spence, located 40 miles away in the town of Robert Lee, has run dry. Within the city, Twin Buttes Reservoir is less than 7 percent full. Thirty miles away, O.H. Ivie Lake—which San Angelo shares with Midland, Odessa and Abilene—is less than 20 percent full. Lake Nasworthy—a small lake on the east side of Twin Buttes—is doing just fine, but the city won't tap it until it has exhausted every other drop of water it has.

The reservoirs used to be destinations for fishermen, boaters, and family weekenders—oases in crispy, semiarid West Texas. “Now if you go out there, it's dead silent,” Boyd said.

Lest San Angelo end up like O.C. Fisher's fish, the city has made use of its money, engineers, and lawyers to hunt for water in central-west Texas for the past 30 years. The results so far: rights to build a \$120 million pipeline that will link the taps of San Angelo to the Hickory Aquifer, 65 miles away in McCulloch County.

But there's a catch: the Hickory Aquifer is naturally radioactive. “The Hickory won't turn you green...” San Angelo Councilman Dwayne Morrison said, “...but it's got more radium in it than the EPA standards allow. So we've got to filter it.”

And filter the radioactive water they will, with a projected \$40 million price tag. Critics of the plan say that San Angelo's city government is chasing an expensive solution that will only trim the burgeoning city's water need.

But it might be a heads-up decision. The Texas Water and Development Board, which develops a long-term plan for Texas' water every five years claims that if Texas can't solve its water troubles, the state will lose one million jobs, \$116 billion in revenue and 1.4 million residents by 2060.

In addition to San Angelo, Midland, Abilene, Odessa, and Amarillo are all advancing major water projects to ensure that their cities can continue to grow, even in the face of the drought. Growing populations and the burgeoning agriculture industry have depleted Texas' ground and surface water over time. The TWDB estimates that Texas' water supplies will decrease by about 10 percent by 2060.

And as Austin and San Antonio—big cities on the other side of the state—start looking upstream to quench their water needs, West Texas towns are banding together to ensure that they have the water—and the legislative leverage—to ensure their futures.

The Oasis of West Texas

Situated on the border between West Texas and Central Texas, San Angelo is 60 miles from the nearest Interstate Highway (Interstate 10 in Sonora) and 90 miles away from the nearest city, Abilene. It's a small city in the middle of small-town Texas, with state highways connecting the likes of Brady, San Saba, Robert Lee, and Voca to the "big city."

By West Texas standards, San Angelo is an oasis. The city was built around the intersection of the Upper, Lower, and Middle Concho Rivers. Within the town, the city has O.C. Fisher Lake, Twin Buttes Reservoir, and Lake Nasworthy, which the city keeps at a constant level year-round, drought or no drought. “With San Angelo’s lakes, the city has always felt greener than the rest of West Texas,” said Chuck Brown, district manager of the Upper Colorado River Authority, which manages three of the five reservoirs in the area.

After a terrible flood in San Angelo in 1936, city leaders began to build these reservoirs for flood control and water supplies. In 1953, O.C. Fisher dam was constructed on the North Concho and in the early 1960’s Twin Buttes dam was built on the South and Middle Concho Rivers. The city’s three lakes were constructed to control flooding of the North, Middle, and South Concho Rivers, which flow through San Angelo. Over time, the lakes transformed themselves into hubs for water recreation in West Texas, even as San Angelo used them to supplement its main water source—Lake Ivie, which it shares with Midland, Odessa, and Abilene.

But this grand plan to make the San Angelo area bloom and bustle hasn’t been without its flaws. Without hurricanes, these lakes tend to dry up. The levels of the lakes have been in constant flux since they were constructed. “We just don’t get enough regular rain coming through here,” Brown said. “Every hurricane that builds up in the Caribbean, we are intensely watching it, hoping it will come our way. That’s where we get our excess runoff and fill our lakes back up—those low-pressure systems that come inland.”

However, hurricanes haven't been as reliable as San Angeloans hope them to be. O.C. Fisher has run dry before—the lake caught fire in the early seventies when it ran dry and weeds ignited in the summer sun. Farmers that used to rely on an irrigation canal from Twin Buttes elected to start using the city's wastewater instead when lake levels got too low. And the present drought is the second time in less than a decade that San Angelo has had less than 24 months of water in its five reservoirs (2005 being the last).

Even a hurricane would be hard-pressed to solve San Angelo's water problems because of San Angelo's growing thirst. In 2010, the city's population was 93,200, up from 88,439 in the 2000 census. The population is growing at a steady three percent per year and the reservoirs aren't able to effectively quench the city's need for water anymore.

The city uses between 20 and 22 million gallons of water per day in the summer and can only receive 15 million from its largest reservoir, Lake Ivie. With two of San Angelo's reservoirs dry, and Lake Nasworthy kept at a constant level that means the rest of the water comes from Twin Buttes, which is now only 7 percent full.

Water has never been a reliable resource in West Texas. "We... live drought to drought," Brown said. "It's not something we're real fond of, but it's kind of something we may be a little more used to than people say in Central Texas and the Austin area are used to."

Though San Angelo has come in and out of droughts, after the record dry and hot 2011, everyone agrees, this is a new ballgame.

Throughout the month of June, maximum temperatures were 10-12 degrees above normal, with highs topping 100 degrees on 26 of the 30 days. At the same time, from January through August, San Angelo received less than five inches of rain.

According to state climatologist John Nielson-Gammon, 2011 has been the worst one-year drought in Texas history. On average, Texas received less than 25 percent of its normal 12-month rainfall rate. Beginning in October 2010, most of Texas experienced a relatively dry fall and winter, but the record dry March 2011 brought widespread extreme drought conditions to the state. A record dry March through May was followed by a record dry June through August, and the 12-month rainfall total for October 2010 through September 2011 was far below the previous record set in 1956. In addition, average temperatures for June through August were over two degrees above the previous Texas record and were close to the warmest statewide summer temperatures ever recorded in the United States.

The Radioactive Solution

Without a hurricane or promise of regular rain in the future, San Angelo is willing to go to great lengths to find water.

“On average we lose about 6 vertical feet per year from our lakes to evaporation,” San Angelo Mayor Alvin New said. “We lose more water to evaporation every year than we can take. We need to find more groundwater so that the heat can’t get to it.”

San Angelo water planners say that even though it’s radioactive, the Hickory is the city’s best option to do this—all of the other nearby groundwater is even more problematic. In 2007, the city thought they’d struck gold when they sampled water the Clear Fork aquifer in the nearby town of Knickerbocker. But the water proved to be too salty despite initial tests, and not plentiful enough to desalinate. The same thing happened in Mertzon in 2001.

Mayor New says these futile efforts drove the city to the faraway, radioactive aquifer.

“When you go through all those processes and they’re not proving fruitful and then you watch Spence Reservoir to the North of us go dry—it’s been really desperate for the past few years—and then you watch the drought in the 2003, 2004, 2005 timeframe and how it affected the area’s reservoirs—it spurred me to think we really need to get the Hickory on,” he said.

The Hickory Aquifer contains an elevated amount of radium, a naturally occurring and radioactive element. “It’s by no means a secret,” said Dwayne Morrison, a San Angelo city councilman. “People have known that water’s been radioactive since people started drinking from it.”

But news of the Hickory’s radioactivity has been snowballing over the past three decades. In 1983, surveyors discovered that Hickory water contained levels of radium as much as 13 times greater than the limits allowed by the EPA. However, in the small town of Brady, Texas—which relies almost entirely on Hickory water for its municipal supply—the naturally occurring radium has latched on to the rust and calcium buildup in the city’s aging steel water pipes, raising serious concerns about the health effects on the city’s 5,500 residents.

A 2001 Texas Commission on Environmental Quality report pointed out the Hickory Aquifer as one of the most radioactive aquifers in Texas, and said, “Without a feasible means to treat the drinking water and manage the residuals, the Hickory Aquifer would become unusable as a public drinking water source.”

The report goes on to say that these levels of radiation could produce one additional cancer for every 400 persons. Environmental Protection Agency regulations allow for cancer risks to be no more than an additional cancer for every 10,000 persons.

Brady first realized it had a serious radiation problem when it unearthed water pipes in the October 2010 and had them tested with a Geiger counter. The radiation emitting from the pipes was so high that they qualified as radioactive waste. Even a local scrap yard refused to recycle them. Steel pipes still make up more than 75 percent of the Brady's water infrastructure.

While most groundwater has contaminants that must be removed for it to be drinkable, water with higher levels of radium can lead to increased cancer rates, according to the EPA. In 2000, the EPA lowered the acceptable levels of radium in drinking water, causing concern among smaller communities that lacked the means to treat the water.

That's when radiation in Hickory water became an issue, says David Huie, the manager of the Hickory Underground Water Conservation District. "Nobody had any issues with it until the day the Environmental Protection Agency lowered their numbers," said Huie, the district manager of the Hickory Underground Water Conservation District. "All of the sudden the next day everybody's water was bad."

After the change, some water utilities (such as the Richmond Springs Water Supply System in San Saba County) quit using Hickory water entirely. Others have struggled to find the means to treat the water. After the Environmental Protection Agency raised the standards for radium, Brady built a multimillion-dollar treatment plant to blend surface water from Brady Lake with the radium-enriched Hickory water. But since the drought,

Brady's reservoir has dried up and the town is building another multimillion-dollar filtration system. The town of Melvin is now relying on bottled water funded by low-interest loans from the state.

"The communities have been left out to dry," said Huie. "If all of these little towns around us dry up...so does San Angelo's economy, so does their financial strength."

Conflict in San Angelo

Even with plans to build a radiation filtration system, San Angeloans are still murmuring about the radioactive water pulsing through the city's water pipes. And they aren't just concerned about alpha particles—water rates are ballooning in order to cover the costs of these projects.

With his crumpled fedora resting atop a thicket of scraggly hair, concerned citizen Jim Turner holds court in a San Angelo Burger King. A retired army engineer who decided to stick around San Angelo after being stationed in the city's Goodfellow Air Force Base two decades ago, Turner claims to have been to more San Angelo city council meetings than any of the city council members themselves. "I wanted to go someplace where Wal-Mart didn't sell snow shovels, and this pretty-well fit the bill," he said.

Thus Turner has established himself as a self-proclaimed thorn in the side of city government. He usually takes the seven-person council to task over tax increases that affect retired citizens—a quest that has recently become bound up with the issue of his monthly water bill. He now pays \$35 per month amount for the utility in his modest apartment, up \$15 since the council passed the increase in July to help fund the Hickory pipeline project. "They came in with the most optimistic projections as they could when

they tried to sell the project to us,” Turner said. “But now when they have to get real about it, it’s going to cost a lot more.”

In 2008, Water Manager Will Wilde told the San Angelo council that the first phase of the project would cost \$83 million. Since then it’s ballooned to \$120 million, which Kiah Collier, a reporter with the San Angelo Standard Times, points out that for perspective's sake, total expenditures for the city's 2010-11 budget was about \$112.5 million.

Allie Devereaux, a fourth-generation San Angeloan and activist, says the Hickory Pipeline is emblematic of San Angelo living outside of its fiscal and natural resource means: “Our leadership expends enormous amounts energy and resources trying to increase the population base,” Devereaux said in a San Angelo Standard-Times column. “This will, in the end, only exacerbate our problems. If that energy were utilized to creatively develop a thriving city of under 100,000, we would begin heading in the right direction.”

“Especially with the changes in the cost of the pipeline some activists around town have started to question whether the pipeline will even solve the problem,” Kiah Collier with the Standard-Times said. “The pipeline isn’t supposed to solve the problem, it’s only going to bring in 6-7 million gallons of water a day. We still use at least 14 million a day. It’ll all depend on the state of things once it gets online.”

The San Angelo City Council awarded Dallas-based Carollo Engineering with the Hickory pipeline contract. According to estimates by Carollo, the total cost of the project is estimated to be \$160,200,000 (that figure includes a radiation treatment plant to be

built in downtown San Angelo). The current average monthly bill for residential water usage is \$32.77 and the average increase due to the pipeline project is \$13.52.

There are also the multimillion-dollar second and third phases of the project, which will increase the pumping capacity of the well field in 2025 and 2036—and the more than \$1.5 million a year it will cost to dispose of the radium extracted from the water at an out-of-state facility. “They’re not lying about the cost,” Turner said. “But with their rhetoric, they’re minimizing the problem in their own minds and in the public’s mind.”

Turner and others are concerned about the prospect of pumping in the radioactive water to have it filtered in downtown San Angelo—a worry not lost on city officials. San Angelo’s water planners are well aware of Brady’s radioactive water pipe scare.

“I don’t understand why we wouldn’t just treat it there,” Councilman Dwayne Morrison said. Morrison proposed to create a treatment plant in McCulloch County in order to keep the 65-mile long pipeline radiation free. “The key issue is when you do your filtration you go all of the sudden from a small amount of radioactivity in the water to where you’ve concentrated it. Then you have to ship it to a radiation storage facility, which is going to cost money.”

Morrison proposed building a filtration station in McCulloch County, but the council voted it down, citing maintenance and personnel costs.

Water Utilities Director Will Wilde says that the untreated, radioactive water that will be shooting through the 65 miles of pipeline from the Hickory well field to the city will be well protected. “We’re using a plastic pipe that won’t corrode and we’re making sure that

sediment won't build up," he said. "Those are the main ways that radiation built up in the Brady pipes and we don't want that happening in ours."

Over the past two years, the Mayor and city council launched a campaign to increase public awareness of the Hickory pipeline and San Angelo's water situation.

"Misinformation about the radioactivity of the Hickory have run rampant," Mayor New said. After KHOU, a Houston television station, produced an exposé on Brady's radioactive water pipes, New said that he started to feel more pushback from the public. "We've learned from Brady's mistakes. The same thing won't happen here."

Though the city had secured a low-interest state loan through the Texas Water Infrastructure fund, the city needed more cash—which was secured by way of a water rate increase. Voters approved this in a 2010 November referendum.

"The drought helped us be urgent in our process," Mayor New said. "San Angelo is serious about finding water."

Hisham "Hutch" Musallam, associate vice president of Carollo, said the company testing the water's effect on the kinds of pipes they might use: "We're taking this into account and I would say we will be utilizing the best technologies to remove the radium."

"Most groundwater has either radium or something like this," he said. "We will [do]... everything possible to protect the human health and the environment. As such, there's a lot of design decisions that we have not finalized yet. That's what we'll be working on in the next couple of years."

Musallam said they will be “pigging the pipes”—running a mechanical scrubber through them—every few months to clean iron and other deposits on which radium could collect.

The cost of all of this—including the disposal of the radioactive filters from the water treatment plant, which at this point will cost the city more than \$1.5 million a year to dispose of at an out-of-state facility—is something opponents of the project say officials aren't taking into account in the total costs of operating the system.

Depending on the treatment technology used for the raw groundwater, the residuals may be in one of two forms—solid or liquid. Disposal of solid rather than liquid waste could lead to different methods of disposal including discharge to the sewer, deep well injection, land application, and landfill.

Jim Turner says that maintaining the system and replacing a pipeline if it happens to break—especially given the radium problem—is not only a safety issue but something that could drastically increase costs. "I think they're wildly optimistic about how cheap it's going to be to operate and maintain this whole system once they get it in place," he said.

But the cost of solving San Angelo's water problem isn't going to get any cheaper, says San Angelo Mayor New. “This is the cheapest that we're going to get this done,” he said of the Hickory Pipeline. “With the economy slowing down, we're never going to get better prices on our bids.”

The Alliance

The City of San Angelo has formed a formal “alliance” with fellow water-strapped city governments Midland and Abilene in order to pool resources and share water-finding projects.

Abilene and Midland are also spending millions trying to secure new water resources, though their targets aren’t as radioactive as the Hickory. Abilene is constructing a new reservoir that will be finished in 15 years, and similar to San Angelo, Midland is constructing pipelines to groundwater-rich properties bought up decades ago.

With water running out all over the state, water has become a commodity for municipal water utilities. Just as San Angelo has bought up the rights to water in the Hickory Aquifer, big cities on the other side of the state are starting to head upstream, looking for the solution to their water woes. “We realized that we have to coalesce and work together on these sort of efforts and work together,” Mayor New said. “We need to represent a population out here that’s not 100,000 people, but instead asking for water as 1 million people.”

Mayor New says the alliance is significant not only because it will allow the cities to pool water, but also it will allow them to coordinate as the state government goes about implementing its State Water Plan. “We’ll be able to afford bigger projects and we’ll be able to make our voice heard at a legislative level and at the courts if need be,” he said.

Created every five years by the Texas Water Development Board, the State Water Plan is a series of suggestions for how funds should be distributed throughout the state, with a goal of securing water for the next 50 years.

The plan combines 16 regional plans that predict how much water communities will need in the future, accounting for population growth and increases in energy production, agriculture, and other industries that use water.

This year's plan is the first to place Texas at a water deficit—with overall water demand exceeding overall supply. To avoid this, the TWDB recommends 562 water supply projects at a cost of \$53 billion. These projects include new reservoirs, groundwater pipelines and desalination facilities. The plan claims that cities, whose needs total \$45 billion, will need an estimated \$27 billion in state financial assistance to finance those projects. Even with all these projects, there are still unmet needs, especially in agriculture.

“West Texas cities need to team together not only to coordinate water, but also to try and make sure their water policies are able to pull weight in the state legislature,” San Angelo City Councilman Paul Alexander said.

But this is easier said than done after this past year's \$27 billion state budgetary shortfall and billions in cuts to state-funded projects. Even as the drought wore on this year, legislation that would have provided funding for about half of the \$53 billion worth of projects identified in the 2007 State Water Plan died in a House committee during this year's legislative session.

Critics of the plan believe that the state's water planning involves too much development and too little conservation and reuse. Alyssa Burgin, director of the Texas Drought Project, a conservation advocacy group says that this kind of urgency is fueled by backwards thinking. “Instead of going out to find more limited resources, cities need to

adopt more effective conservation strategies,” he said. “These kind of projects are just temporary solutions. Barring a hurricane, if cities don’t more effectively conserve water, citizens will move on and economies will suffer.”

More than one-third of the projected need for water for the state over the next 50 years in times of drought is met through conservation and reuse. New reservoirs account for 17 percent of that meet need and 34 percent comes from other surface water supplies.

However, it’s important to note that these are suggested measures, and there is no guarantee that any of it will be implemented. Especially if it costs money.

The plan predicts the state's population to increase 82 percent between 2010 and 2060, while water demand is expected to increase by about only 22 percent. They claim this will be possible with an overhaul of irrigation techniques and curtailing the energy industry’s use of water. About \$20 billion of the \$53 billion worth of water supply projects will be needed in the next decade. The 2007 State Water Plan had a similar price tag.

“These projects are normally carried out on a regional or municipal scale,” said David Marshall, Engineering Division Manager with the Tarrant Regional Water District.

“There’s no grand scale state-wide water pipelines in the works yet, and that would probably be done by a private entity before it would be done by the state.”

After letting the measure that would have set up a dedicated funding source for the water plan this session die, the Legislature passed a ballot initiative that would create a \$6 billion revolving bonding program administered by the TWDB that will help provide

financing for water plan and other projects, as well as provide matching to receive federal funding.

But it failed this year on the November 2nd ballot. Without the bonding program, Rep. Drew Darby (R-San Angelo) thinks the challenge for the next legislative session will be to find a dedicated funding source for these water projects.

Conservation and Expansion

City planners like Mayor New and Will Wilde admit that the Hickory won't solve everything. Additional water has to be combined with conservation efforts in order to secure San Angelo's growth.

According to Will Wilde, San Angelo water utilities director, the city has cut its average peak daily water consumption by more than one-third, from nearly 40 million gallons a day to 20 to 25 million gallons a day since 1998. "We've seen a dramatic decrease in residential water use over the past 10 to 12 years," Wilde said. "People got the message after the droughts earlier in the decade—2000, 2003, 2004. We put water restrictions into effect around then and people have been very responsive."

In February 2006, the San Angelo City Council voted to permanently limit residential lawn watering to twice a week in the summer and once a week in the winter. The city has spent millions installing an automatic water meter reading system to better keep track of system leaks and water use and installing a rainwater collection system for the renovation of historic City Hall. It also stopped watering many of its parks this summer after the city's water supply hit—and then dropped below—the two-year mark and an emergency water conservation plan took effect.

But in September, the Mayor and City Council relaxed watering restrictions that would have only allowed residents to water their lawns once a week. “You can tell somebody ‘you can only water once a week’ but if they do water once a week, they’ll actually use more water,” said Mayor New, who claimed that watering once per week was less efficient than twice. “It was the matter of ‘Well, you can only water once a week.’ Does that psychologically cause people to conserve water, or do you tell them that they can water once a week?”

City Councilman Paul Alexander said that increased water rates played a significant role in curtailing water use. “Once water users go above a certain amount per month, they’re going to have to pay for it,” he said. “Some of them will still ignore it, but in general it seems to be a good way to get the message across: we’re running out of water.”

Since the City of San Angelo runs its own water utility, the city ends up losing money when water users use—and therefore pay—less. “That’s part of why we’ve had to have some revenue increases,” Alexander said. “People are conserving more and with big projects like the Hickory project coming around, we’re just going to need that revenue.”

State Representative Drew Darby (R-San Angelo) said higher water prices could be a solution to that dilemma, but only because it will help Texans realize the value of water. “Texans have to start treating water like a commodity or they’re going to keep throwing it away,” he said. “The cost of water is going nowhere but up as the state’s population grows and water becomes scarcer — especially in this part of the state.”

“Water is a function of availability,” Darby said. “Now that we don’t have the water, we’re going to have to start paying for it. It’s not given, it’s a commodity, just like oil.”

Allie Devereaux, the fourth-generation San Angeloan who disapproves of the Hickory project, says that these conservation measures won't be effective in the water crisis moving forward. "Realistically, San Angelo is about as big as it can get with the natural resources available to this area," she said. "And that's not so bad either. We can shift our focus more on growing up than growing out."

She says that San Angelo has an unrealistic understanding of how it can develop a city with no reliable water source, on the edge of the desert. "Even once-a-week lawn watering is excessive," Devereaux said. "People need to get creative: shower outside with a portable shower or set up a gray water system and kill two birds with one stone."

Devereaux's grandfather was the first judge of Irion County, just west of San Angelo. Her family has passed down stories of what the area used to look like: "lush endless grasses "stirrup high" and deep, crystal clear waters teeming with fish, diverse savannas of oak and pecan lining these waterways.

"There were dry spells then, too," she said. "...But the land was more resilient."

Devereaux's hunker-down mindset is not the norm in West Texas. Mayor Alvin New says that conservation is important, and it doesn't have to get in the way of growth. "San Angelo is a growing city and an important economic center for the surrounding area," New said. "Almost 100,000 people live in this city and a 200,000 more live in the area around it. As a city, we have a duty to ensure the future of the people here...I don't see any reason why we can't sustain a slow, steady growth pattern that we've held on to for the last 40 years of 3 percent."

City Councilman Paul Alexander agreed. “We are Americans and Americans are innovative,” he said. “Our challenge right now is to figure out how to get water to these people, and I know that as Americans we’ll be able to do it.”

“How can you call it a drought when it’s always dry?” John Boyd asks. “Growing up we always heard ‘we’re in the drought...we’re in the drought.’ Even when it was a rainy year, it was still the drought. I firmly believed that the drought is something we’re always in,” he said.

“And then this year came and there was no rain. And there was no catching up the lake levels or restocking the fish. The drought is the West Texas climate, but it was only this year where we found out what being in the drought meant—at least the ones in my generation who weren’t around in the fifties,” he said.

Allie Devereaux and other conservationists say that West Texas towns like San Angelo are getting too big for their own resources. With populations booming and water resources dwindling, that just might be the case. But West Texans, at least the ones who plan West Texas water development, don’t appear to be too interested in the idea of slowing down. These towns and cities—many of which used to be no more than wet spots in the desert to stop for the night—are now wrangling growing economies, higher standards of living, and the needs of a thirstier, swelling population.

San Angelo’s Hickory project is prototypical of this spirit. Governments of these towns are sustaining their growth with quite a bit of money, innovation, and desperation.

“Americans have a very determined spirit and I believe even more so Texans and even more so than that West Texans,” said Boyd. “They’re a very brass tax people—do what must be done in the face of hardship.”

At the same time, these towns have struggled to convey the growing seriousness of drought and water shortages. San Angelo has made great strides in doing this. According to Will Wilde, San Angelo’s water utilities director, the city has cut its average peak daily water consumption by more than one-third from nearly 40 million gallons a day to between 20 and 25 million gallons a day.

“But I don’t think they fully realize that they’re in that hardship, or at least they’re not acting like it,” Boyd said after a trip to the San Angelo’s dried-up Spence Reservoir in Robert Lee, Texas, which has between 50 and 100 days of water.

“We went to San Angelo and we were sitting out on a patio at a restaurant and they got those little water misters that... were literally spraying water into the air. We come from one location where the town folks had to ration water for so long. And then the town that had drank their water, they were just spraying water into the air,” he said.

Speaking about San Angelo’s constant-level Lake Nasworthy, Boyd said, “When they have a lake in the middle of town they don’t have to see the lakes drying up every day.”

And as long as San Angelo gets water, they won’t ever have to.

Appendix I:

The Last Oasis in West Texas (Audio Script)

Even though the worst drought of a lifetime is bearing down on San Angelo and the rest of West Texas, you wouldn't be able to tell around the city's Lake Nasworthy, which, if you believe the stories of San Angelo realtor Ryan Newlin's, seems to be the wettest, wildest lake ever.

Cut 1: Newlin: I've seen deer swimming in this lake before. We've been sitting there out by the campfire and we saw a deer crawl up out of the lake onto our lot...and run. So those deer apparently swim.

That's Ryan Newlin, he and his father own E.R.A. Realty, a San Angelo real estate agency that deals with a lot of the houses around Lake Nasworthy.

Other tales include a giant fan of blades on Nasworthy dam that makes for great swimming, a killer swan, and an old power plant that used to keep half of the lake warm.

Cut 2: Newlin: The water was literally like a warm bath on that side of the lake... so they could bring in Red Fish from the coast—the freshwater Red Fish—and they would live here. But now that's not working, the water's cooled off again so the red fish can't survive. But that was kinda cool—you don't catch those anywhere but down on the coast.

Lake Nasworthy isn't just weird because it's got weird animals—and people—it's a full lake in a town that only has 22 months of water left. Two of San Angelo's other reservoirs have dried up; the one just upstream from it is at 7 percent capacity.

The Upper Colorado River Authority's Chuck Brown says Lake Nasworthy is San Angelo's last line of defense against the looming Texas drought.

Cut 3 Brown: Nasworthy is kept constant level, but in drought crisis time, if all the other lakes are dry, that one will be exhausted as well.

After the driest year in state recorded history, San Angelo has less than 22 months worth of water in its five surface supplies, including all 3 billion gallons in Lake Nasworthy, O.H. Ivie Reservoir, its main water supply, is expected to run dry by the end of next year if dry conditions persist.

San Angelo used to be called the "Oasis of West Texas," and from Nasworthy you'd believe it. Crispy grass and trees surround the reservoir, but the yards remain irrigated with water pumped up from the lake. As a city with four lakes and three rivers running through the city, people come for miles.

Cut 4: Newlin: There's about 550 homes on this lake, half of those people pretty much are from out of town and the majority of that is Midland/Odessa all that oil money. We're two hours away from them, not a lick of water, so they come down here.

According to the San Angelo Chamber of Commerce, the lake has become a bigger draw with major events throughout the year like drag boating in the summer and the Wake the Desert wakeboard tournament in September. Here's Chamber of Commerce President Phil Neighbors:

Cut 5: Neighbors: These had great attendance and the major weekends like Fourth of July, Easter weekend and throughout the summer we had great tourism or visitation to the lake because it was in good shape whereas some other ones in the region were not in as good of shape.

But the drought still looms around the lake. Newlin worries that the lake is going to run dry, and what could happen when people will stop coming.

Cut 6: Newlin: These are our little lake cabins that we use to hang out and for the last three years I lease 'em out on the weekends. So if we do run out of water... it'll definitely hurt my rental income.

But for now, the lake will remain the last Oasis in West Texas.

Fadeout Cut 7: Newlin: This dude started drinking Zimas and kicked a catfish and the needle went straight through his toe. That catfish got stuck to his foot and we had to peel him off with pliers.

Appendix II:

Reclaiming Reclaimed Water from Farmers (Audio Script)

San Angelo's wastewater is treated and delivered to an irrigation canal that pumps water onto 10,000 acres of farmland that span more than 80 farms.

With San Angelo's lakes quickly evaporating in the historically hot, dry conditions, some city leaders are starting to view the use of wastewater exclusively for irrigation as a huge waste.

Cut 1: Alexander: We're just doing this because it's all we know what to do with our water. That's the wrong attitude to take – "We don't know what to do with it so let's just give it to farmers."

San Angelo City Councilman Paul Alexander is eyeing the millions of gallons of wastewater the city produces each day. He says the amount of water that flowed into the canal last year alone could sustain the city for six months.

Cut 2: I think we need to be more proactive than reactive and say "What can we do with this?" and we can save some of our water supply by using this effluent water on parks golf courses, things like that. That's normal thinking for a city that's trying to get more efficient with their water.

Of the 14 million gallons of water the city uses each day on average, about two-thirds, or 9 million of it, is flushed as wastewater.

Last year, the city delivered 2.8 billion gallons of treated wastewater to the 16-mile canal, which runs northeast from Lake Nasworthy to just past the small community of Veribest.

Constructed by the Federal Bureau of Reclamation, the canal hasn't always carried San Angelo's wastewater. Until 1995, farmers received fresh water from Twin Buttes Reservoir until a dry spell, when the city struck a deal with the farmers.

Cut 3: Green: We traded the city of San Angelo fresh water for wastewater.

That's Yantis Green, he's the manager of the Tom Green County Water Control & Improvement District No. 1, which operates the canal. Under the original agreement between the district and the Bureau of Reclamation, the district is entitled to 25,000 acre-feet of Twin Buttes water every year.

Cut 4: Green: Next year, 2012, the city will generate about 9,000 acre-feet of wastewater and we by contract get 100 percent of that, in exchange for us leaving 9,000 acre feet of water in Twin Buttes.

But with Twin Buttes well under 50,000 acre-feet, farmers could find themselves without a water source.

Cut 5: Green: Without the effluent, we wouldn't have water right now. Until the lake gets back above 50,000 acre-feet.

But according to San Angelo's water manager Will Wilde, the city is nowhere near actively pursuing the use of wastewater for municipal use.

Cut 6: Wilde: First we've got to have our primary source—you've got to have a source to start with before you end up with wastewater. So we want to make sure on the primary side we have ample quantities to meet most of what those projected long-term needs are here. At a point in time, I'd say, probably within the next 5 to

10 years—I think you’ll see a lot more emphasis on treating the wastewater to water quality standards, bring it back into the system as a supplement to your primary source right there.

The City of San Angelo has just begun building a pipeline to the Hickory Aquifer in McCulloch County, 65 miles away. The project won’t be completed until early 2013, but officials hope it will supplement San Angelo’s water supply for years into the future.

Though Wilde says, he thinks modern San Angeloans would more open to drinking treated water than those of previous generations.

Cut 7: Wilde: I think there were a lot of those in the past – I think, as we have another generation of individuals coming up, I think it’s a lot more accepted and people realize that all water is wastewater, it just depending where it’s coming from.